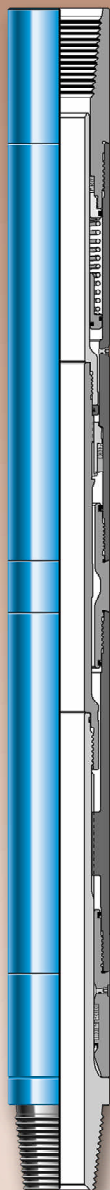


SUPER II FISHING JAR INTENSIFIER

Instruction Manual 4025



Super II Fishing Jar Intensifier

One Company Unlimited Solutions



NATIONAL OILWELL VARCO

Super II Fishing Jar Intensifier

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Hydromechanical Drilling Jars

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The designs and specifications for the tools described in this instruction manual were in effect at the time this manual was approved for printing. National Oilwell Varco, whose policy is one of continuous improvement, reserves the right to discontinue models at any time, or to change designs and specifications without notice or without incurring obligation.

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General Description

The **Bowen Super II Fishing Jar Intensifier** is designed to be operated in conjunction with the Bowen Super, and Super II Fishing Jar models. The Intensifier also operates in a straight-pull operation which accentuate the jar force initiated by the Super or Super II Fishing Jar. Its function is to supply acceleration to the collars and the upper portion of the Hydraulic Jar during its (jarring) free stroke.

Each Bowen Super II Fishing Jar Intensifier is designed to match a corresponding Bowen Super or Super II Oil Jar. The Bowen Jar Intensifier is essentially a hydraulic fluid spring which stores energy when a strain is pulled on the running string. When the strain is removed by the free stroke of the Jar, this stored energy is released, accelerating the drill collars and jar upward until a blow of high impact is struck.

The variable load of the Super II Intensifier and Jar is controlled by varying the pull load of the working string. A lighter pull creates a lighter impact at the struck point. A heavier pull creates a harder impact at the strike point. The Intensifier will also amplify and accelerate the jarring action.

Application

The Bowen Jar Placement Program is now available to all Bowen customers. The program allows the operator to determine the best string configuration and applied pull load for a specific configuration or impact requirement that helps to avoid excessively high impact loads. The impact load information of the Jar Placement Program can be compared to the strength of the fishing string, to include all tools being used, and to the fish, for possible limitations on pull and impact load.

The time spent running the program and planning the fishing job is very beneficial.

NOTE: The Bowen Fishing Jar Placement Program is written specifically for Bowen Jars and Intensifiers, with the unique characteristics of each tool incorporated in the program. See program for additional information.

The Bowen Super II Jar Intensifier would be installed in the string when maximum jarring impact and impulse are needed. This is particularly true in shallow, deviated or directional holes. The Super II Jar Intensifier should be located above all the concentrated mass of (Drill Collars or Heavy Weight Drill Pipe, etc.), which is located immediately above the Jar. The working string directly above the Intensifier should not have a "weight per foot" change in the first 1,000 feet of string directly above it, except for flexibility when needed for bending.

The fishing tools should not be run at a highly deviated point in the hole or in the curvature of a directional hole if it can be avoided. In deviated, directional or over-size holes, any jar and intensifier should be isolated from stiffer sections by a more flexible joint of string. This is to protect the tools from excessive bending loads and increase the probability of successful fishing.

It is recommended that not less than two (2) joints of Drill Collars nor less than four (4) joints of Heavy Weight Drill Pipe be installed between the Fishing Jar and the Jar Intensifier or between the Fishing Jar and the working string.

CAUTION: It is advisable to run the Bowen Fishing Jar Placement Program for proper configuration to avoid excessively high impact loads that might damage equipment.

Use with Fishing Jar

The Super II Jar Intensifier is always used in conjunction with a Super or Super II Fishing Jar. During conventional jarring operations with either mechanical or hydraulic jars, the intensity of the blow struck is a function of, and proportional to the accelerated rapid movement of the entire running string above the jar. This accelerated movement will often be considerably diminished by friction of the running string against the wall of the hole. In such cases much of the energy will be lost. Also, at very shallow depth, the lack of available stretch in the running string causes a great loss in the effectiveness of expected acceleration, due to very small amount of stretch in the running string being available. The Bowen Jar Intensifier provides the means to store the required energy immediately above the jar and drill collars, to effectively offset the loss of stretch in, or drag on the running string. An important secondary contribution of the Bowen Jar Intensifier is to utilize its contained hydraulic fluid to cushion the shock of the running string as it rebounds, after each jarring stroke. This reduces the inherent tendency to cause shock-damage to the tool and running string to a minimum.

Use of the Bowen Super II Jar Intensifier allows less drill collars to be used in a specific case than would otherwise be possible. This is particularly true at shallower operating depths, where excessive numbers of drill collars are sometimes used, to utilize mass in place of available stretch. Use of too many drill collars with their great mass is often damaging to the tools and the running string, and should be avoided.

For any fishing operations involving the use of a the Bowen Fishing Jar such as Fishing, Coring, Milling, or Washover, it is recommended that the Bowen Fishing Jar Placement Program be ran to provide the operator the specific configuration necessary for possible jar actions.

Operation

Before using the Bowen Super II Jar Intensifier, carefully examine it to ensure the unit has been assembled and filled correctly and no leaks are evident.

NOTE: All Bowen Jar Intensifier give the best performance when using Bowen Liquid Spring Intensifier Fluid.

Insure the Intensifier is filled with the proper Bowen Liquid Spring Intensifier Fluid and tested in a Bowen Jar Tester or equivalent tester, to ensure the proper performance.

The Internal and external connections come from the Bowen manufacturing facilities with the proper torque. All external connections should be checked after use to ensure the proper torque of all the threaded connections are made up as per the "Recommended Torque," as seen in Table 10-1, page 12.

CAUTION: Do not tong on the threaded connections. To do so will damage the Intensifier. Tong the unit approximately 4" from the threads.

Rig Up

For the maximum effectiveness of jar action the Super II Jar Intensifier should be carefully installed in the string above the concentrated mass (Drill Collars, Heavy Weight Drill Pipe, etc.), which is between the Bowen Super or Super II Fishing Jar and the Intensifier.

WARNING: The Super II Fishing Jar is in the cocked (closed) position when it is shipped to the rig from the factory. Once closed, the Jar should not be left suspended from the elevator, especially with any appreciable weight suspended below it. From this position, the Jar may open, dropping the length of its stroke, and may cause damage or injury.

Jarring

When using the Super or Super II Fishing Jar without an Intensifier in the string, it is recommended that a low initial load (30-50% of Maximum Pull Load) be applied and then the load increased on the proceeding strokes if needed. This allows the operator to see and feel the effects of the jarring action.

CAUTION: At no time during the pull cycle of the Jar should the "Maximum Pull Load (lbs.*)" be exceeded. See "Strength and Test Data," Table 10-1.

When the Super II Jar Intensifier is placed in the string for maximum jar affect, the minimum applied pull load should be used as per the "Minimum Pull Required (Above the Weight of the String and Collars) to Obtain an Effective Blow" as per the Bowen Intensifier Strength Data as seen in Table 10-1, page 12.

The velocity and relative impact load of the jar blow is controlled by the amount of stretch taken in the running string (pull load) and the weight of the drill collars installed above the Fishing Jar. When using the Super II Jar Intensifier, it is necessary to also install contiguous similar mass above the Super II Jar Intensifier for a minimum length of 1,000 feet to lessen the reverse wave inertia on the Fishing Jar.

1. To strike the initial blow: Set the string down to ensure the Fishing Jar is closed. Then, raise the string, applying the desired pull load at the Fishing Jar.
2. Set the brake and wait for the Fishing Jar to strike. The first blow may take from a few seconds to several minutes, depending on such variables as depth of operation, amount of stretch on the string (pull load) use of the Intensifier, downhole temperature and hole condition.

3. Close Jar and repeat: After a stroke is made, it is necessary only to close the Jar before taking the stretch in the string to strike the next blow. Each blow may be struck at any desired pull load at the Fishing Jar up to the "Maximum Pull Load" for the Fishing Jar. Refer to "Strength & Test Data," in Table 10-1, page 12.

Rig Down

The Super II Jar Intensifier itself requires no specific action for rig down except it is recommended that the Intensifier not remain suspended in the elevator for extended periods of time. After performing Rig Floor inspection for oil leaks lay it on the derrick floor.

WARNING: The Super II Fishing Jar is in the cocked (closed) position. Once closed, the Jar should not be left suspended from the elevator, especially with any appreciable weight suspended below it. From this position, the Jar may open, dropping the length of its stroke, and may cause damage or injury.

Maintenance

Maintenance of the Bowen Super II Jar Intensifier is minimal but important. The primary maintenance is normally confined to complete inspection and redressing after each prolonged or hard use, and careful checking after every moderate use. Magnetic particle inspection of stressed components should be performed after each use.

Rig Floor Maintenance

After moderate use on a short job, the Super II Jar Intensifier is kept at the rig site where it requires only minor maintenance which, in most cases, may be done on the rig floor.

Immediately after removing the Jar Intensifier from the fishing string, flush all mud from the bore, especially inside the Washpipe (6).

To prevent corrosion and facilitate tool make-up during the next tool use, coat the Intensifier joint box and pin threads with Bowen anti-gall grease.

Dressing Area Maintenance

After prolonged and/or hard use, the Bowen Super II Jar Intensifier should be taken to an adequate dressing area as soon as possible for complete maintenance, including:

1. Disassembly;
2. Inspection;
3. Reassembly;
4. Re-Filling with Bowen Liquid Spring Intensifier Fluid; and Testing.

CAUTION: The Bowen Super II Fishing Jar Intensifier is a hydraulic jar; therefore, close tolerances and smooth finishes are mandatory. Also, the Intensifier must be kept free of all contamination (dirt, sand, metal etc.). Contamination left on parts can cause damage or malfunction.

Equipment

The following tools, equipment and parts should be obtained before starting Dressing Area maintenance:

1. Bowen Vise and Tong, or equivalent, suitable for Jar size.
2. Overhead Crane, 2,000 lb. minimum capacity.
3. Pipe Wrenches, suitable for the ODs of interior Intensifier components.
4. Chain Wrenches, suitable for spinning on/off threaded parts.
5. Bowen V-Belt Pulley Assembly No. 92070, or equivalent, which can be suspended from the crane to support threaded parts while spinning on/off.
6. Straps of suitable strength and condition for safely lifting and handling parts with overhead crane.

7. Bowen Jar Tester, or equivalent, suitable for Jar size. See Figure 11-2, page 19.
8. Bowen Super II Jar Intensifier Service Kit, as shown on page 16. See also "Replacement Parts List", page 11.
9. Floater (9) Positioning Tool for specific Intensifier size. See "Replacement Parts List", page 11.
10. Complete Packing Set and Fill Plugs (12) for specific Intensifier size. See "Replacement Parts List", page 11. Also see "Recommended Spares" on page 7.
11. Bowen thread lubricant.
12. Bowen Liquid Spring Intensifier Fluid.

Disassembly

Bowen recommends an Assembly Drawing be available for the specific size Super II Jar Intensifier being service. Drawings can be obtained through National Oilwell. Throughout the disassembly, inspection and re-assembly procedures, the following notes may be helpful:

- "Replacement Parts" list on page 7 lists all major components in the order in which they are assembled, with sub-assembly parts listed below each major component. Item Numbers are assigned here for each part name.
- In Figure 6-1 on page 7, the Item Number in parentheses indicates the location of parts as shown in the diagram.
- Each Item Number corresponds to a Part Name and specific Part Number in the chart accompanying Figure 6-1 and in the "Replacement Parts" list on page 7.
- Part Numbers are specific to Jar Intensifier OD sizes.

- "Top" and "bottom" refer to the ends of the Jar Intensifier as it is run in a fishing string; i.e., the Mandrel (39) is on the bottom end, while the Top Sub (1) and Washpipe (6) is on the Top.
- To prevent damage during servicing, do not use vise, tongs, wrenches, or chains over Fill Plug (12), on any seal surfaces, or on any other smooth surface of the tool.
- When disassembling the Bowen Super II Jar Intensifier, note the direction and location of all Packing, O-rings and Wipers. This may help in re-assembly of the Jar Intensifier.

Disassembly Procedure

Complete disassembly of the Bowen Jar Intensifier should proceed as follows:

1. Secure the Intensifier in a Pipe vice, at approximately the center of the Jar Intensifier on the Splined Body (32).

WARNING: Do not remove the Fill Plugs (12 & 36) until the tool is fully disassembled. The possibility of trapped residual pressure exists and can cause possible damage or injury.

2. Break the connections at the Pressure Body (7) and the Top Sub (1). All connections are right handed threads.
3. Place an open-mouthed container below the joint of the Pressure Body (7) and the Top Sub (1) to catch the compression fluid for use again during assembly.
4. Back off the Top Sub (1) until the oil runs out of the tool, past the threads, allowing the oil to drain into the open container. Remove the Top Sub (1) and lay it aside.

WARNING: The Top Sub (1) must be secured firmly during removal due to the possibility of trapped residual of high pressure.

5. Tilt the total unit with the Top Sub (1) end down to allow the Floater (9) Spring (5) to carefully slide out and off the Washpipe (6) seal surface and remove the spring. Re-clamp the Intensifier to remove the remainder of the components.
 6. Place the open mouth container under the Pressure Body (7) to Connector Body (25) connection allowing the oil to drain in a container when loosened.
 7. Loosen and remove the Pressure Body (7) with firm smooth action being careful not to score the Washpipe (6) seal finish surface or damage the Piston (19) packing seals. The Floater (9) attachment, inside the Washpipe (6), will be forced off the Washpipe (6) at this same time and cause some drag when attempting to remove the Pressure Body (7).
 8. Loosen and remove the Washpipe (6) by placing a chain wrench on the large end of the Washpipe (6). Lay the Washpipe (6) Body aside ensuring that the seal finish is not scored or scratched.
- CAUTION: Place the wrench only on the wrench surface provided at the upper (larger) end of the Washpipe (6).**
9. Gently remove the Seal Body (15) and Piston (19) from the Mandrel Extension (28).
 10. Loosen and remove the Connector Body (25) from the unit.
 11. After removing the Connector Body (25) the wrench attachment location of the Mandrel Extension (28) is revealed.
 12. Use this raised area of the Mandrel Extension (28) to fasten the chain wrench to loosen and remove the Mandrel Extension (28).
 13. Loosen and remove the Mandrel from the Mandrel Body (35) being careful not to damage the Mandrel Body (35) packing.
 14. Loosen and remove the Mandrel Body (35) from the Spline Body (32) which completes the disassembly.
 15. Inspect the seals and seal surfaces for damage and replace all seals, O-rings and packing seals.
 16. Unclamp the Spline Body (32) from the vise and lay it aside.
 17. Remove the two Seals from the OD of the Mandrel Body (35) and from the Connector Body (25).
 18. Remove the two Seal Packing Assemblies from the inside upper end of the Mandrel Body (35) and the Top Sub (1). To remove these seals, proceed as follows: Using either a 625 (or 626) tool, or a bent screw driver, carefully insert the tip of the blade between the O-Ring and the Seal Protector Ring. Then lift out the O-Ring, taking care to not damage or mar the Seal Protector Rings or Non-Extrusion Rings. Do not run the tool around the groove under the rings, which tends to mar the groove by scratching the surface.
 19. With the O-Ring removed, visually examine the Seal Protector Rings and Non-Extrusion Rings for any indication of damage, burrs or advanced wear. Remove any such damaged or worn rings.
 20. Check the similar Seal Assemblies in the Washpipe (6) Body and the Piston (19) Seal Body (15).
 21. Carefully clean all the disassembled parts with solvent and wipe them dry with a lint-free, clean cloth, then thoroughly oil all the parts with a good grade of light, clean oil.
 22. Check all the parts for defects. Examine the polished surfaces for pits or scratches. Any abrasions on these surfaces will damage the O-Ring seals, resulting in loss of fluid during the operation of the tool. Any rough, shallow pits, or burrs, may be removed by use of fine emery cloth. Parts with major pits or deep scratches and grooves must be replaced.
 23. Check the spline on the Mandrel (39) and in the Spline Body (32) for burrs or upsets. Upsets may be carefully ground away with a grinder or a small hand file and afterwards polished with emery cloth.
 24. Examine the Washpipe (6) Body bore for signs of scratches or galls. Minor damage of this nature may be smoothed out with emery cloth, or if very minor, may be disregarded. Any deep scratches in the smooth bore of the Washpipe (6) will render it unfit for further service.
 25. Carefully examine the Piston (19). Polish off any abrasions, nicks, galls or burrs at the OD or ID. Use a small hand file or emery cloth. Any damage to the Piston (19) Ring seating surface will render the Piston (19) unusable.
 26. Remove the Fill Plugs (12) and install new Fill Plug (12) O-Ring Seals on the Fill Plugs (12). (**DO NOT** reuse this fluid unless it is properly filtered using the Bowen Silicone Fluid Reclamation Unit Part Number 80960). If no new fluid is available the fluid must be filtered through the Bowen line filtered attached to the Service Kit.

Super II Jar Intensifier Diagram Assembly No. 153445

Item	Part Number	Replacement Part Name
1	153455/005	Top Sub
2	568241/005	Top Sub O-Ring
3	153459/005	Top Sub Packing Set
4	153464/005	Top Sub Packing Retainer
5	152859/005	Floater Spring
6	153452/005	Washpipe
7	153453/005	Pressure Body
8	568342/005	Floater OD O-Ring
9	153454/005	Floater
10	568335/005	Floater ID O-Ring
11	568010/005	Fill Plug O-Ring
12*	102025/005	Fill Plug (8)
13	568010/005	Fill Plug Parbak for Fill Plug
14	568232/005	Washpipe O-Ring
15	153643/005	Seal Body
16*	370-12	Seal Body Non-Extrusion Ring (4)
17*	376-12	Seal Body Seal Protector Ring (4)
18	568234/005	Seal Body O-Ring
19*	153644/005	Piston (2)
20	153461/005	Piston Packing Set
21*	153462/005	Piston Packing Backup Ring (2)
22*	153463/005	Piston Packing Retainer Ring (2)
23	153458/005	Connector Body Seal (Large)
24	568243/005	Connector Body O-Ring (Large)
25	153450/005	Connector Body
26	538242/005	Connector Body O-Ring (Small)
27	152915/005	Connector Body Seal (Small)
28	153642/005	Mandrel Extension
29*	2249-9	Mandrel Non-Extrusion Ring (2 ea) (8)
30*	2250-9	Seal Protector Ring for Mandrel O-Ring (2 ea) (8)
31	568231/005	Mandrel O-ring
32	153447/005	Spline Body
33	152915/005	Mandrel Body Seal
34	568242/005	Mandrel Body O-Ring
35	153446/005	Mandrel Body
36*	102025/005	Second Fill Plug, see Item 12 (8)
37*	153456/005	Mandrel Body Packing (2 ea)
38*	153457/005	Mandrel Body Wiper
39	153448/005	Mandrel
40* †	153465/005	Complete Packing Set (12)
41* †	153466/005	O-Ring Packing Set
42 †	146959/006	Plastic Thread Protector for 3-1/2 IF (NC 38) Pin
43 †	146960/006	Plastic Thread Protector for 3-1/2 IF (NC 38) Box
44* †	22709/130	41.75 Setting Tool
45* †	153707/005	Floater Positioning Tool
46* †	50529	Intensifier Fluid
47 †	153823	Thread Lubricant

† Items not shown in the tool illustration

* Recommended spare parts (recommended quantities)

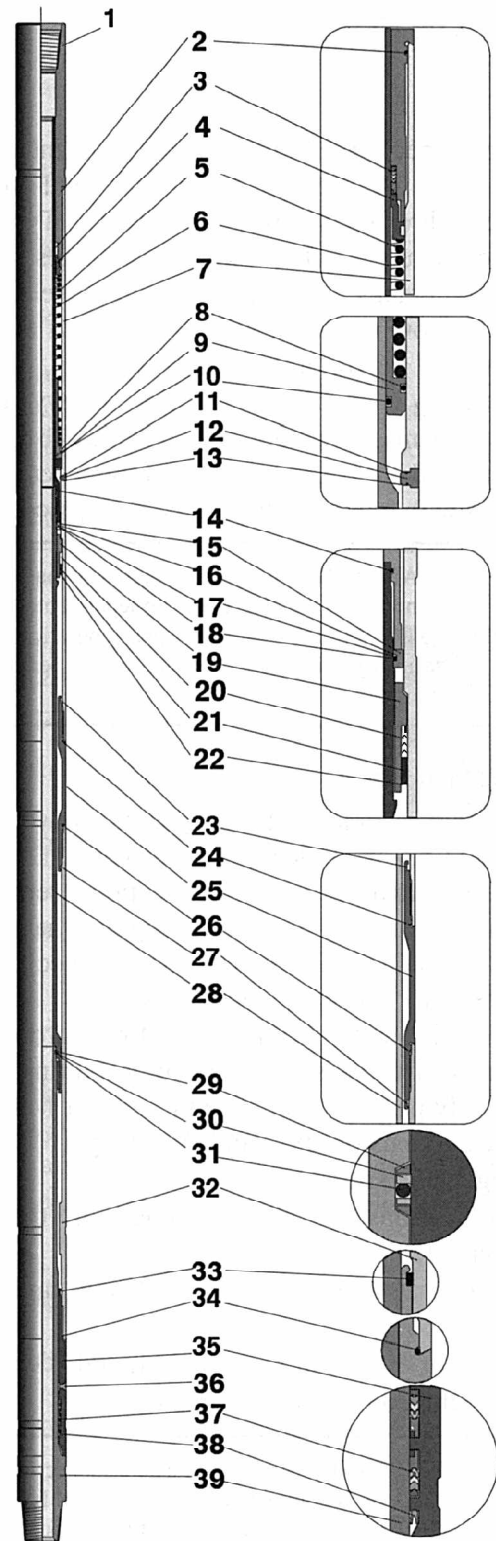


Figure 6-1
Super II Jar Intensifier Parts Illustrated

Inspection

During inspection of the Super II Jar Intensifier parts, look for damage to smooth and sliding surfaces, threads, grooves and bores. Types of damage include: pitting, nicks, scratches, burrs, abrasions, cracks, and galled or excessively worn areas. "Minor" damage refers to any flaws that can be removed using a triangular grinder or file, followed by polishing with fine emery cloth. "Major" damage cannot be restored by hand grinding and polishing, such as fatigue cracking. All parts with major damage must be replaced.

WARNING: Uncorrected damage, major or minor, may render parts undependable and could interfere with proper operation or seriously fail during test and cause personal injury.

Inspection Items

Carefully steam clean all parts or use solvent and wipe them dry with clean, lint-free cloth. Examine straight box and pin thread connections, removing any minor damage with a triangular hand file before polishing with emery cloth. Specifically, examine seal surfaces, smooth surfaces, and the corners, sides and bottoms of all O-Ring grooves at both ends of threads. Also examine butting faces on all body parts, as well as end faces of Mandrel, Mandrel Extension (28), and Washpipe (6). Look for fatigue cracking on:

- pin sections at inside corner of the 15° shoulder;
- corners at the bottom of O-Ring and seal grooves;
- corner at bottom of thread relief; and
- those thread nearest the thread relief.

WARNING: Magnetic particle inspection is strongly recommended for locating fatigue cracks. Parts with cracks must be replaced.

Assembly Notes

National Oilwell recommends an Assembly Drawing be available for the specific size Super II Jar Intensifier being serviced. Drawings can be obtained through National Oilwell. Throughout the disassembly, inspection and re-assembly procedures, the following notes may be helpful:

- "Replacement Parts" list on page 7 lists all major components in the order in which they are assembled, with sub-assembly parts listed below each major component. Item numbers are assigned here for each part name.
- In Figure 6-1 on page 7, the item number in parentheses indicate the location of parts as shown in the diagram.
- Each item number corresponds to a Part Name and specific Part Number in the chart accompanying Figure 6-1 in the "Replacement Parts" list.
- Part Numbers are specific to Jar Intensifier OD sizes.
- "Top" and "bottom" refer to the ends of the Jar Intensifier as it is run in a fishing string; i.e., the Mandrel (39) is on the bottom end, while the Top Sub (1) and Washpipe (6) is on the Top.
- To prevent damage during servicing, do not use vise, tongs, wrenches, or chains over Fill Plug (12), on any seal surfaces, or on any other smooth surface of the tool.
- When disassembling the Bowen Super II Jar Intensifier, note the direction and location of all Packing, O-Rings and Wipers. This may help in re-assembly of the Jar Intensifier.
- All connections are made with right-handed threads and should be coated with Bowen Itcolube, taking care not to lubricate above thread relief. Remove excess Itcolube from the threads. Due

to the weight of the Super II Jar Intensifier components it is necessary to assemble the unit with access to a 2,000 lb capacity overhead hoist. Before re-assembly, make sure all parts are clean and in good condition. Installing marginal components will in the long run cause time loss and cost more than replacing the worn components. Coat all metal parts with a good grade of clean, light oil and lay them out on clean cloths or paper. It is recommended that the Super II Jar Intensifier be redressed with a new Complete Packing Set (Item 40) on page 7, which consists of all packing, O-Rings, back-up rings, wipers and Seal Body (15) seals for a specific Intensifier.

Pre-Assembly

1. Install O-Rings, Wiper: Coat all O-Rings, back-up rings and wipers with a good grade of clean, light oil and install them in their proper places.

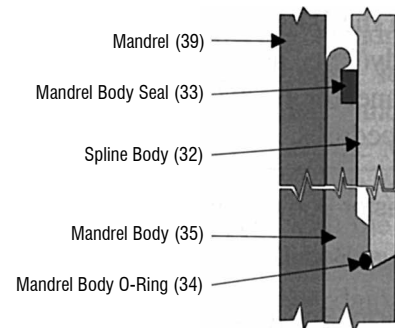


Figure 8-1: Mandrel Body O-Ring and Seal

2. Mandrel Body (35) Install the Mandrel Body Packing Set (36)(37) into the ID of the stencil groove end of the Mandrel Body (35) as illustrated in Figure 6-1. Install the Mandrel Body Wiper (38) into the ID on the stencil end as seen in Figure 8-1. Install the Mandrel Body (35) O-Ring, and the Mandrel Body (35) Seal on the OD of the non-stenciled groove side of the Mandrel Body (35).

Referring to the Figure 8-2 demonstrates that the Mandrel Body (35) Packing Set comes in two major sections and when installed the brass rings face each other and contact the Mandrel seal surface when installed, as seen below.

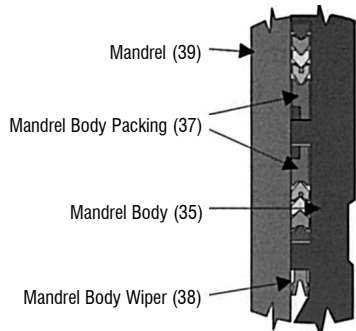


Figure 8-2: Mandrel Body Packing Set & Wiper

3. Mandrel (39): Install the O-Ring, two (2) Seal Protector Rings, and the Mandrel Non-Extrusion Ring onto the OD of the Mandrel, as seen in Figure 8-3, prior to the installation of the Mandrel later on in this procedure.

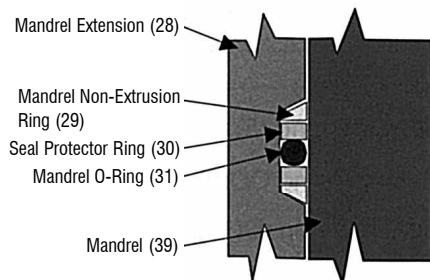


Figure 8-3: Mandrel OD Ring Seals

4. Top Sub (1): Install the Top Sub (1) Packing Set, as illustrated in Figure 8-4, into the ID of the Top Sub (1), which is the stencil groove end of the Top Sub (1). Install the Top Sub (1) Packing Retainer Ring into the Top Sub (1) to contain the Packing Set. Install the Top Sub (1) O-Ring in preparation for installation onto the main unit later in this procedure.

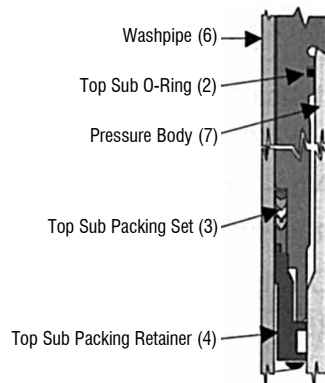


Figure 8-4: Top Sub Seal Installation

5. Piston (19) Packing Set: Install the Piston Packing Set (20), Piston Packing Backup Ring (21), and the Piston Packing Retainer Ring (22) in the Piston (19) OD, as seen in Figure 8-5 below. Put the Piston (19) aside for installation later on in this procedure.

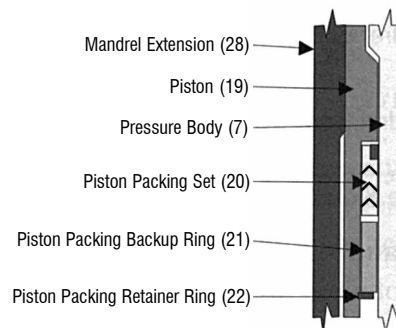


Figure 8-5: Piston Packing Set Installed

6. Floater (9): Install the two O-Rings into the Floater (9), as seen in Figure 8-6. The Floater (9) will be used later in this procedure.

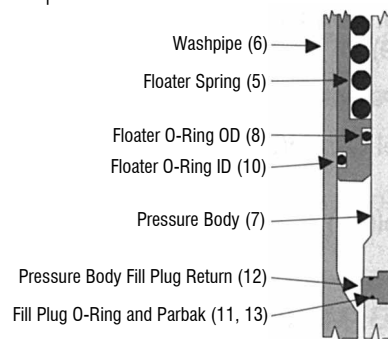


Figure 8-6: Floater O-Ring Installation

7. Seal Body (15): Install the Seal Body (15) O-Ring, Seal Body (15) Protector Ring, and the Non-Extrusion Ring into the ID of the Seal Body (15), as shown in Figure 8-7 below. Lay the Seal Body (15) aside in preparation for use later in this procedure.

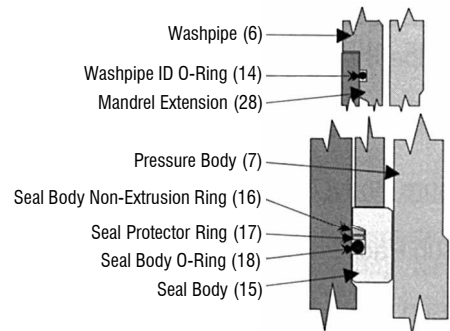


Figure 8-7: Seal Body Seal Installation

8. Connector Body (25): Install the Connector Body (24) (large) O-Rings and Large Seal (23) into the OD non stencil groove end of the Connector Body (25), as illustrated in Figure 8-8. The Connector Body (25) will be used later in these procedures.

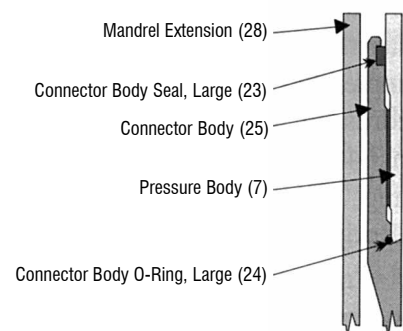


Figure 8-8: Connector Body Large Seal Installation

9. Connector Body (25): Install the Connector Body (26) (small) O-rings and Small Seal (27) into the ID stencil groove end of the Connector Body (25), as illustrated in Figure 8-9. The Connector Body (25) will be used later in these procedures.

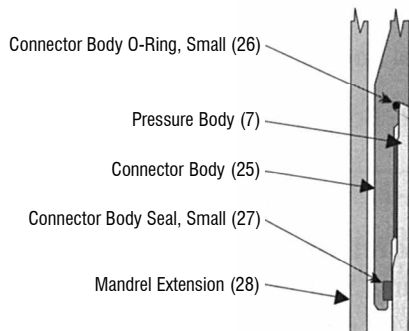


Figure 8-9: Connector Body Small Seal Installation

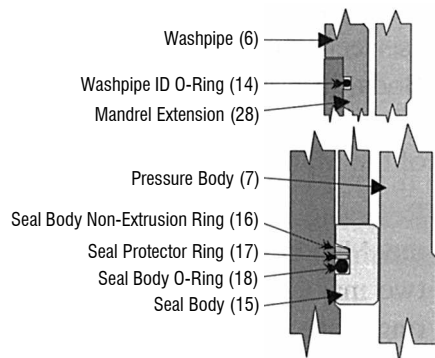


Figure 8-10: Washpipe O-Ring Installation

10. Washpipe (6): Install the Washpipe O-Ring (14) in the ID past the threads of the wide-end of the Washpipe (6) as shown in Figure 8-10 above.

Final Assembly

Refer to illustration Figure 6-1 which contains the item numbers of the total parts, and Figure 8-11 which provides the major component part broken out by name.

1. Place the Spline Body (32) into the vise approximately 12" from the stencil groove end of the Spline Body (32).

2. Lightly coat with Bowen Itcolube anti-gall grease the connector threads of the Mandrel Body (35) insuring to not get compound on the O-Ring or Mandrel Body Seal.

3. Lubricate, with a clean light oil, the Mandrel Body (35) Seal and O-Ring and insert the Mandrel Body (35) into the Spline Body (32) stencil end and tighten to prescribed torque in Table 10-1 on page 12.

4. Lightly coat the threads of the Mandrel with Bowen Itcolube anti-gall grease, lubricate the O-Ring, Seal Protector Ring, and Non-Extrusion Ring and carefully insert the Mandrel into the Mandrel Body (35). With the Mandrel mass being held up and leveled with the 2,000 lb. hoist and the Mandrel slung on the belt sling making sure the spline does not damage the Mandrel Body (35) packing material.

5. With the Mandrel carefully started into the Mandrel it may be necessary to apply considerable pressure on the Mandrel to keep it moving into the Mandrel Body (35). By whatever means available, press the Mandrel into the Mandrel Body (35) until it is flush to the Mandrel Body (35).

6. Sling the Mandrel Extension (28) in the hoist belt sling, lubricate the ID threads on the stencil end of the Mandrel Extension (28) and insert it into the Spline Body (32) and tighten to the torque specifications identified in Table 10-1.

7. Lubricate the Connector Body (25) OD O-Rings and gently maneuver the Connector Body (25) with the stencil groove end first over the Mandrel Extension (28) being careful not to damage the seal surface on the Mandrel Extension (28), tighten the Connector Body (25) onto the Spline Body (32) to the prescribed torque as in Table 10-1.

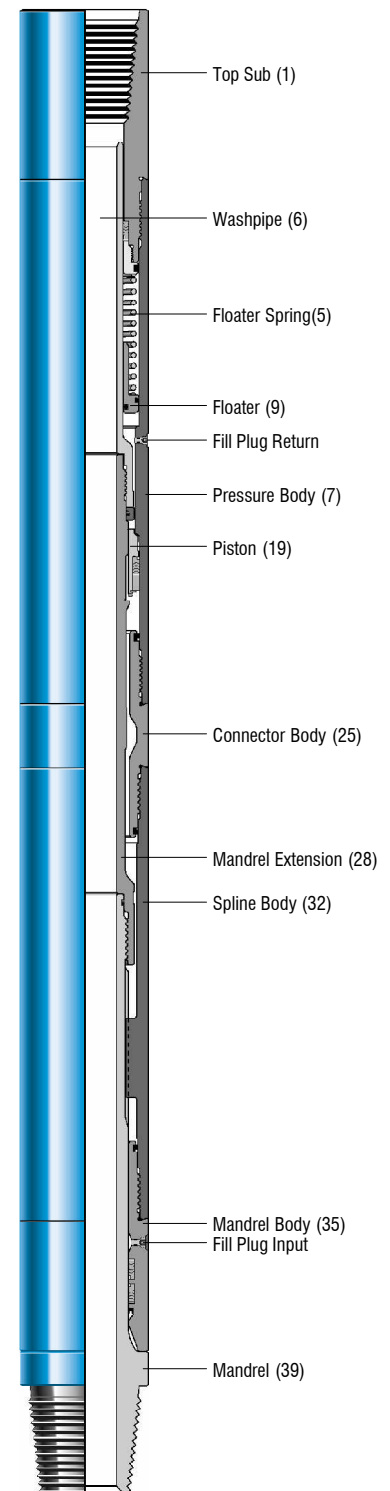


Figure 8-11: Super II Jar Intensifier Part Layout

8. Place the Piston (19) stencil groove end away from the Connector Body (25), aligned to the spline on the Mandrel Extension (28) and liberally apply lubricating oil to the Piston (19) packing, rings and spline.
9. Lubricate the ID O-Ring set of the Seal Body (15) and insert it with Non-Extrusion ring away from the Piston (19). The Seal Body (15) is a tight fit and will be pressed on by the Washpipe (6).
10. Lightly coat the threads of the Mandrel Extension (28) with Bowen Itcolube anti-gall grease, lubricate the O-Ring in the ID of the Washpipe (6). Sling the Washpipe (6) in the hoist belt sling and tighten the Washpipe (6) on the wide part of the Washpipe (6). This action will also press the Seal Body (15) flush to the Piston (19) ledge not the Piston (19).

CAUTION: During the installation of the Washpipe DO NOT use the seal surface to torque or tighten the Washpipe into position. Use only the large OD for the tool attach surface.

11. Lightly coat the threads of the Connector Body (25) with Bowen Itcolube anti-gall grease taking care to ensure that no grease gets on the O-Ring or Seal. (**DO NOT** reuse this fluid unless it is properly filtered using the Bowen Silicone Fluid Reclamation Unit, Part Number 80960.)

While the Pressure Body (7) is hanging in the hoist sling maneuver the Pressure Body (7), with the end with approximately 4" of thread depth or lessor thread depth of the two ends, over the Washpipe (6), Piston (19) and tighten it onto the Connector Body (25) to the torque specifications identified in Table 10-1 on page 12.

12. Lubricate the O-Rings and ID of the Floater (9) and install it over the Washpipe (6) and into the Pressure Body (7). Insert the Floater (9) Positioning Tool over the Floater (9) and use the Top Sub (1) to press on the Floater (9) by tightening the Top Sub (1) to the Pressure Body (7) until a measurement of 4" is reached between the Top Sub (1) and the lip

of the Pressure Body (7). Remove the Top Sub (1) and the tool in preparation for the installation of the Floater (9) Spring (5).

13. Lightly coat the threads of the Top Sub (1) with Bowen Itcolube anti-gall grease taking care to ensuring that no grease gets on the O-Ring insert the Floater (9) Spring (5) then the Top Sub (1) and tighten to the specified torque as specified in Table 10-1.

Filling with Fluid

Proper filling of the Bowen Super II Jar Intensifier requires the use of both Fill Plugs (12): one in the Mandrel Body (35) and the other in the Pressure Body (7). Proceed as follows:

1. Thoroughly clean and inspect all parts. Give special attention to the seals, replacing any that show signs of damage or wear.
2. Assemble all parts except the Fill Plugs (12). Refer to "Final Assembly" in on page 10 for detailed assembly instructions.

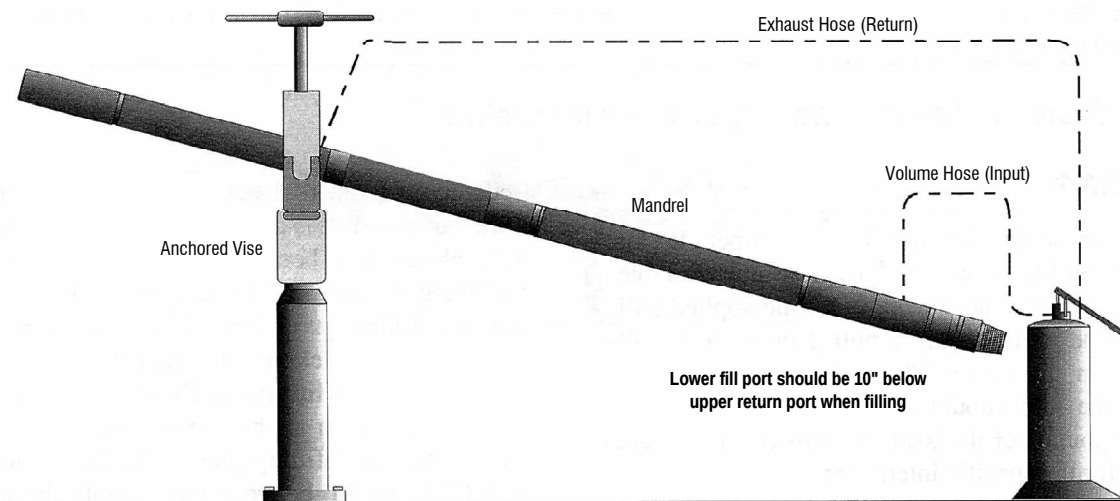


Figure 9-1: Filling the Super II Jar Intensifier Illustrated

3. Clamp the Intensifier in a vise in the horizontal position, with the Mandrel Body (35) Fill Plug (12) hole on the upper side of the tool.
4. Attach the fill hose from the fill pump to the Mandrel Body (35) Fill Plug (12).
5. Attach a second hose to the Fill Plug (12) located in the Pressure Body (7) and the other end will be placed into the reservoir of the pump to create a return flow path. Continue to pump the fluid until such time as the fluid begins to flow, bubble free, from the return hose into the reservoir.
6. Remove the Pressure Body (7) Fill Plug (12) hose and insert the Pressure Body (7) Fill Plug (12). Tighten the Fill Plug (12) snug, but do not over tighten the plug.
7. After the tool is pumped full, insert the Mandrel Body (35) Fill Plug (12). Tighten it snug, but do not over tighten.
8. Insert and tighten the Fill Plugs (12 & 36). Test the tool in an appropriate tester.
9. If the recommended pull load is not reached or if the tool remains open greater than the 1-1/2" of stroke repeat the procedure of filling.

Testing

Test the action of the Bowen Super II Jar Intensifier in a Bowen Jar Tester or other suitable test rack which has a readout for the applied pull load. The tool should be pulled open to its full stroke in the tester, The pull load required to open the tool should be within plus or minus 2,000 pounds of the load value listed in the data sheet for the specific intensifier.

WARNING: Do not stand beside tool during tests. Extremely high pressures develop and metal body failure could cause serious injury.

When the applied load is removed, the tool should close within 1-1/2" of complete closure (measured where the Mandrel meets the Mandrel Body (35). If the tool does not close to within 1-1/2" of travel, it is an indication that too much residual air has been entrapped in the tool, producing an undesirable air cushion. In such a case the filling procedure should be repeated, first however, backing the Mandrel Body (35) Insert out, by **one full turn**. Thus backed off, the tool will receive a slightly excessive volume of fluid. After the refilling procedure, the Mandrel Body (35) should be re-made completely and tightened, resulting in a slight pre-compression of the fluid. This should overcome the effects of entrained

Table 10-1: Super II Jar Intensifier Maximum Recommended Tightening Torques

Make Up Torques					
Mandrel Body to Spline Body	Spline Body to Connector Body	Connector Body to Pressure Body	Pressure Body to Top Sub	Mandrel to Mandrel Extension	Mandrel Extension to Washpipe
8,200 ft-lbs	8,200 ft-lbs	7,600 ft-lbs	9,100 ft-lbs	2,700 ft-lbs	1,000 ft-lbs

Note: Tightening Torque values are in ft-lb. The above make-up torques are the maximum recommended makeup torques for each connection. They are set at 50% of the calculated theoretical yield torque.

Specifications and Strength Data

- Outside Diameter 4-3/4 in.
- Inside Diameter 2-1/4 in.
- Assembly Part Number 153445
- Standard Connection 3-1/2 IF (NC 38)
- Length 13' 9"
- Stroke 11"
- Maximum Torque @ yield 15,200 ft-lbs. (not considering tool joint connection)
- Maximum Lift Load @ yield 281,000 lbs.
- Maximum Pull Load (to fully open) 100,000 lbs.

Note: All Strengths listed are calculated theoretical yield points and are accurate within 20%.

Note: The Pull Load matches the 4-3/4 x 2-1/4 Bowen Super II Jar and far exceeds the 63,000 lb. Limit of the standard 4-3/4 x 2 Bowen Jar Intensifier

air, friction and pre-compression of the seal assemblies. It should be noted that no harm to the tool will result if it remains open slightly, either during service or in the shop. The only effect is a slight loss of stroke should not be considered important unless it is greater than 1 inch.

NOTE: Use only Bowen Liquid Spring Intensifier Fluid in the Bowen Super II Jar Intensifier. It is specially compounded to perform properly. Any attempt to use a substitute fluid will result in no performance and almost certain failure of the Intensifier.

The entrance of small amounts of lubricating oil into the Intensifier Fluid, such as might be used to oil parts of the tool, will not be harmful, but should be kept to a practical minimum.

The operator will note too that during service, the fluid will become discolored by traces of brown or amber stain. This is caused by bleeding of the seals, while under high pressure, and from thread dope, where this is used on the connections. These traces of discoloration are not detrimental to the fluid or the tool, unless the concentration is heavy enough to include solid particles such as small silvers of rubber.

Bowen Liquid Spring Intensifier Fluid should be kept clean and as free of contamination as possible. It is a special fluid, and relatively expensive.

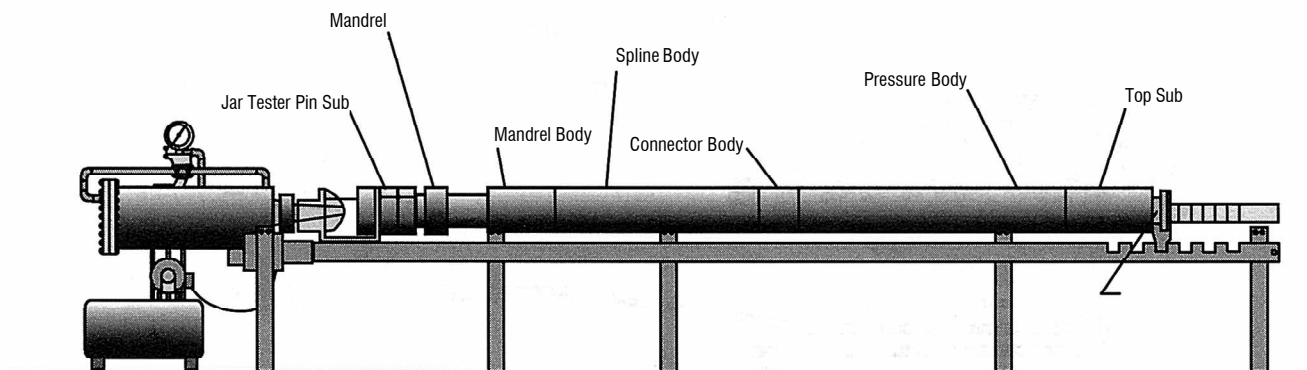
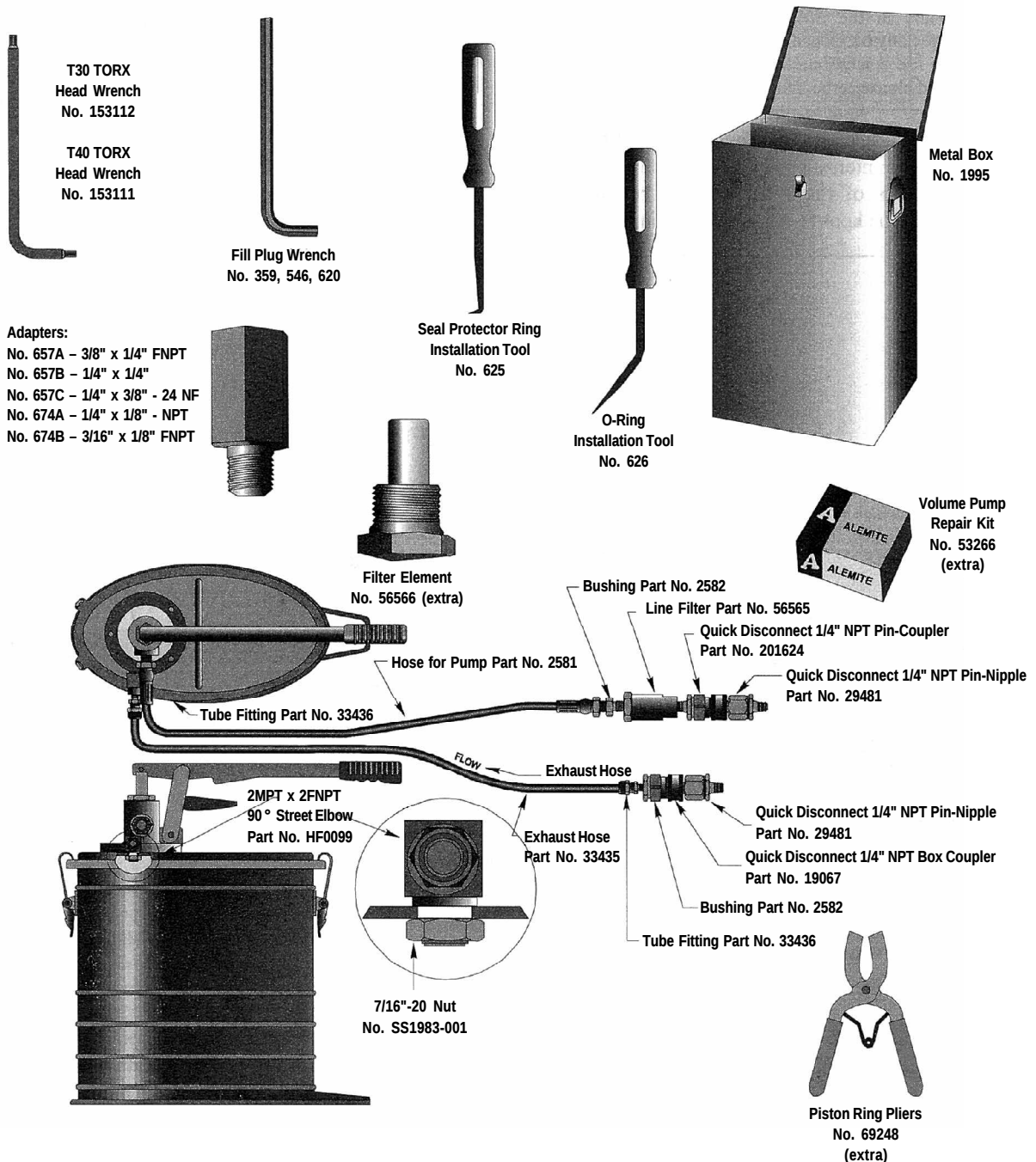


Figure 11-1: Testing the Super II Jar Intensifier Illustrated

Super II Fishing Jar Intensifier Service Kit (55403)

A Service Kit is necessary to properly service the Intensifier. Because these kits are identical for every size Intensifier, a single kit may be used for all Intensifiers at a particular site. The Kit **does not** include a Seal Setting Tool, which is required for each size Intensifier. This Setting Tool must be ordered separately. It is usually stored in the Service Kit metal box.



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* Denotes Manufacturing and Engineering facilities

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